



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,166	09/24/2003	Toshio Kimura	1035-473	4031
23117	7590	11/03/2005	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			ARENA, ANDREW OWENS	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/668,166	Applicant(s) KIMURA ET AL.	
	Examiner Andrew O. Arena	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-5 and 9-12 is/are allowed.
- 6) ☒ Claim(s) 6-8 and 13-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>09/24/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. Figures 15-17 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claim 8 is objected to because of the following informalities: use of "and/or" in line 8. Applicant should spell out the possible combinations, for example: "connected to both a ground terminal and a power supply terminal, or connected to either one of a ground terminal or a power supply terminal. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6-8 and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Regarding claim 6, the recitation of lines 11-12 is grammatically unclear. It could be more accurately stated as "at least one of the through electrodes is a contact through electrode, said contact through electrode being electrically connected to the corresponding semiconductor chip in which it is formed."
6. Regarding claim 7, the recitation of lines 10-11 is grammatically unclear. It could be more accurately stated as "at least one of the through electrodes is a non-contact through electrode, said non-contact through electrode being electrically isolated from the corresponding semiconductor chip in which it is formed."
7. Regarding claim 8, the recitation of lines 4-5 is unclear. Applicant has not defined "an identical signal", further, it seems that comparison of one signal to an identical signal cannot yield a comparative magnitude. The metes and bounds of the limitation "the number of the through electrodes being determined according to a magnitude of an electric current" are not readily apparent. Perhaps this could be more clearly stated as "the number,  $n_1$ , of the through electrodes in a first chip which carries a first total current,  $i_1$ , is related to the number,  $n_2$ , of through electrodes in a second chip which carries a second total current,  $i_2$ , by:  $(n_1 > n_2)$  whenever  $(i_1 > i_2)$ ."
8. Regarding claims 13-16, the recitation "wherein the number of the through electrodes..." is unclear, since it cannot be determined whether the claimed number refers to the first high-current, second high-current, or signal-routing through electrodes.

Art Unit: 2811

This can be clarified as “wherein the number of the plurality of through electrodes which are electrically connected to one another...”. The metes and bounds of the limitation “the number of the through electrodes is increased according to an interconnect line length” are not readily apparent. This limitation is more clearly stated as “the number,  $n_1$ , of through electrodes which span a first interconnect line length,  $l_1$ , through the multiple stacked semiconductor chips is related to the number,  $n_2$ , of through electrodes which span a second interconnect line length,  $l_2$ , through the multiple stacked semiconductor chips, by:  $(n_1 > n_2)$  whenever  $(l_1 > l_2)$ ).

9. Regarding claims 17-20, the recitation “wherein the number of the through electrodes...” is unclear, since it cannot be determined whether the claimed number refers to the first high-current, second high-current, or signal-routing through electrodes. This can be clarified as “wherein the number of the plurality of through electrodes which are electrically connected to one another...”. The metes and bounds of the limitation “the number of the through electrodes is increased in proportion to an interconnect line length” are not readily apparent. This limitation is more clearly stated as “the number,  $n_1$ , of through electrodes which span a first interconnect line length,  $l_1$ , through the multiple stacked semiconductor chips is related to the number,  $n_2$ , of through electrodes which span a second interconnect line length,  $l_2$ , through the multiple stacked semiconductor chips, by:  $(n_1 - n_2) = C * (l_1 - l_2)$ , where  $C$  is some constant of proportionality greater than zero.

***Allowable Subject Matter***

10. Claims 1-5 and 9-12 are allowed.
11. Claims 6-8 and 13-20 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is (571) 272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

